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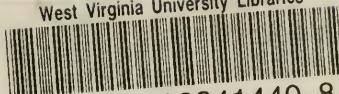
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WEST VIRGINIA

Agricultural Experiment Station

MORGANTOWN, W. VA.

NOTES ON

PRUNING.

HORTICULTURAL DEPARTMENT.

Nov. 1892.



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PRUNING

OF

TREES, SHRUBS AND VINES.

F. WM. RANE, B. AGR., M. S.
Horticulturist.

There has been so much inquiry of the Experiment Station for information regarding pruning, by our farmers and those more particularly interested in the art or science of Horticulture, that the Director has asked me to prepare a bulletin upon the subject.

To treat upon any points which have not already been treated time and again by eminent men, would be practically impossible.

What I here intend and desire to accomplish is to bring before our readers the subject of pruning in such a manner that it will assist any who desire such knowledge, that they may be able after reading this to work more intelligently. It is hoped, also, that many who now, apparently, are negligent as to fruit raising, more particularly may apprehend these fundamental principles and be encouraged to venture in the industry.

Our State to-day is actually importing from other States enough of our more delicate fruits to support numerous horticultural industries of similar nature at home. This should not be and can not continue long. We have almost every advantage, and to allow others to furnish us while we should be producing for ourselves and competing in the great markets of the world, is casting unjust reflection upon our virgin soil, and upon the rightful rank which the name of our State should possess.

We can boast of having one of the largest, if not the largest, fruit farm this side of the Rocky Mountains. The one I refer to in particular is that of the Becker Brothers on the foothills of the Blue Ridge Mountains in Jefferson county. The Becker Brothers purchased a belt of land here in 1887 and immediately set out 33,000 peach trees. Since that time, eight other tracts adjoining have been added, and to-day, the Becker Brothers' fruit farm comprises 2400 acres in one continuous tract*. They have not stopped with peaches alone, but here can be found in great area, vineyards, American and Japanese Plums, Apricots, Japan Persimmons, Quinces, Cherries, Nectarines, English Walnuts, Italian Chestnuts, and Paper-shell Almonds. This magnificent fruit farm is spoken of in this con-

*See description of same in "Weekly Baltimore Sun" Sept 17th, 1892

nection in order to show that in some sections of the State we are progressing rapidly in fruit culture, and as the subject of pruning, if thoroughly familiar, still furthers our success in this pursuit, we can see the important connection.

Pruning has to do with trees, shrubs and vines from the time they are set. If they are neglected, we can not expect them to do their best any more than to expect a trotting horse, thoroughly out of training, to come out and lower his record; or a milch cow, which has been given a certain amount of rations, to give the former quantity or even more milk by depriving her of the original amount of food.

To show further that the interests in horticulture are awakening, the following is taken from the West Virginia Farm Bulletin of June '92. "The following list of gentlemen have recently planted peach orchards in Berkely County: J. W. Wood, Hedgesville 19,000 trees; J. M. Miller, Gerardstown 15,000 trees; S. M. McKown, Gerardstown 5,000 trees; C. W. Richard, Berkely Station, 6,000 trees; Wilson Coe, Gerardstown 2,000 trees; T. L. Richard near Martinsburg, 6,000 trees; J. W. Robinson, Shanghai 3,000 trees; Robert Layman, Martinsburg 1,000 trees; Robert Barkhart, Martinsburg 1,000 trees; Taylor Harper, Hedgesville 500 trees; Mr. Fletcher, Darkesville 500 trees; Mr. Rye, Darkesville 500 trees; Lewis Glover, Darkesville 200 trees; J. T. McKown, Gerardstown 1,000 trees."

When we realize that the above is only an incomplete statement of advance in the peach industry during the past year, in only one county of the State, what can we expect when a *resume* is compiled for the whole fruit industry of the entire State! It is true that Berkeley county is a model county; however, there are many others just as promising, as for example, Jefferson and Morgan, which bound Berkeley on either side, the numerous inland counties, and the great tier of twelve counties which border the Ohio.

There is not as great a tendency toward the peach industry along the Ohio, but it has been demonstrated already that small fruits and apples, especially, are found to flourish and bear in great profusion. On a whole, we therefore conclude that a bulletin on pruning placed at the farmer's command at this time, may meet the wants of our people.

Pruning Generally Considered.

Webster defines the word "Prune" as from the Fr. *provigner* (to lay in the ground as stocks of vine for propagation.) Now meaning "to cut off the superfluous branches of; to trim; to lop; to retrench; to clip." It is a practice made use of much more in the older countries than in the new. The reason for this, doubtless, is that the population is larger and the demands from the soil are proportionately increased. The soil being all utilized, the interest in these vocations are concentrated on what they already possess, experimenting and studying out how to procure the best possible re-

turns. As a natural consequence, it follows that from the necessity thus arising, they familiarize themselves with the principles necessary to procure the desired end. We find in England, France and Germany, that by pruning and thus becoming more familiar with plant life, the people are able to grow more trees and vines to the acre; produce better fruit both as to size and quality; produce earlier fruit; secure longevity of trees, etc. It is for the above reason, perhaps as much as any other, that so many of our best commercial and practical Florists, Gardeners and Horticulturists are of foreign birth. It is often found that a foreigner coming into a community and once procuring a start, immediately, through his inherent qualities or tendencies is a great teacher to his neighbors, while he may be ignorant on any other subject.

There are still men who advocate that it is wrong to prune trees, basing their reasons in the fact that it is not as nature so intended, and that each interference with nature's laws, in just that degree eradicates and weakens the plant. Thus when a shoot is severed, just that much of the plant's original vitality is lost never to be regained. They cite as instances our native trees, and ask who could have pruned our beautiful forests and procured better results in symmetry and beauty than the hand of nature, as already done. This, it is true, can be made to appear quite possible to a man not thoroughly practical. Were it not for the pruning knife which plays such an important part in our nurseries throughout the country, when scientifically guided, we would be in a barbaric age as regards the industry. It is about as reasonable for a man to sit idly by and say that Nature created plenty of fruits in their natural state, and to improve them by the hand of man is unnatural and therefore, should not be done.

Pruning, although simple, must be practised very cautiously. No operation requires greater foresight than the operation of pruning. We must have a definite object in view, and no branches should be removed for whose removal a good reason can not be given. "The reasons which may justify pruning are:

- (1.) The removal of dead or dying branches.
- (2.) Thinning.
- (3.) Helping the growth of one part of the tree by removing another part."*

It is known that the first named reason is justifiable and anybody, be he skilled or not, can perform the operation; pruning for thinning, or the second named reason, can be done properly without any particular knowledge of plant life; and the third named reason, or cutting out one part in order to assist another part, requires simply good judgment. The manner in which the above classification was more definitely elaborated is about as follows: A few well developed branches are of more value than many which are crowded together without light and air.

*Prof. L. R. Taft's Lecture before the American Pomological Society, 1891. Cultivator and Country Gentleman, Nov. 5th, 1891

Pruning for the purpose of thinning, accomplishes:—

- (a) More freedom of growth for the development of parts.
- (b) A production of large, and finer fruit.
- (c) Earliness.
- (d) Ease in gathering crop.
- (e) Less draught upon the soil. *
- (f) The crop is more regular.

If possible, the removal of large, healthy limbs should be avoided. The injury is, of course, in proportion to the amount of loss of leaf surface, and the size of wound. Whether to remove a limb or not is a question to be answered in the affirmative only when the benefits expected from the pruning are larger than the necessary injury. Knife and thumb are better pruning tools than ax and saw. Every blow of the ax or push of the saw in the removal of large limbs, is a threat at the tree's life and vitality. By lessening the leaf's surface, we lessen the digestive apparatus, and consequently the absorption of food.

In transplanting nursery grown trees in orchard, we should cut back the tops to make them correspond with the size of the roots. Such trees often have very little root. The best time for pruning trees in orchard, undoubtedly, is in the spring, as at this time plants will take care of themselves. But although we find that this is the best time, it does not seem to be practical, as at the spring time other work is most pressing, and hence pruning is done in fall or winter when time is at hand. Pruning may be done after the formation of dormant buds in summer, as any damage at that time is quickly repaired. When the wounds are large, the injury is lessened by coating them with clay, paint, or grafting wax. Judicious pruning gives us the means of thickening growth or elongating it, and making it more open and spreading.

Root pruning can be resorted to for the purpose of checking rank growth in a tree, vine, or shrub of bearing age; thus hastening its fruitfulness, but it is not usually advisable to resort to such violent means. Low headed fruit trees are usually preferable. Pruning should be seen to from the first by frequent pruning with the knife and thumb.

Pruning of Fruit Trees.

We advise any one who expects to go into the fruit business to

*"An examination of numerous specimens each, of large and small apples of several different varieties, showed that the weight of seed was not at all proportional to the weight of the fruit. In many, in fact most cases, the total weight of the seeds in the smallest perfectly developed apples was but a trifle short of the weight of the seeds of the specimens of the same variety that weighed two or three times as much. In other words, a given weight of fruit, of the medium-sized, or moderately large apples, contained only one-half as much seed as an equal weight of the same variety composed of twice the number of specimens, did. Chemistry informs us that about 85 per cent. of the mature fruit of an apple is water, and that a very large per cent. of the mineral ingredients is found in the ash of the seed. It is obvious, therefore, that if we wish to make as slight a draft upon the soil, or upon the vitality of our fruit plants, as possible, we should aim, not so much to diminish the total weight, as to diminish the seed, by increasing the size of the individual specimens." From paper by Prof. W. R. Lazenby, read before the Ohio State Horticultural Society, 1886.

any extent, to first procure some standard work and get the subject well in hand.* This will add more than anything that can be secured towards success. When the trees are first received from the nursery before setting them out, if they are not already, prune them that the balance between the root and stem is equal, as in Figs 1 or 2. This equalizes the balance, and the tree is in the best possi



Fig 1 (*C. & C. Gen.*)



Fig 2 (*C. & C. Gen.*)

ble condition, other things being equal, o adapt itself to its new environments.

Place the roots in the soil in such a manner that they will radiate qually in all directions. See Figs 2 and 5. That is do not get all the roots



Fig 3. (*C. & C. Gen.*)

*Downing's "Selected Fruits for the Garden and Market," price \$2.50, Barry's "Fruit Garden," price \$2. Thomas's "American Fruit Culturist," etc. All good books on the general fruits. For each particular kind of fruit can be found special treatises thus devoting the whole attention to the same, as "The Apple Culturist," by S. E. Todd; "Pear Culture for Profit," by Quinn, price \$1, etc. There are two other books that all Horticulturists should possess, namely, Bailey's "Horticultural Rule Book," price \$1. It is a book of the most precise and practical nature, and "The Nursery Book" by the same author, paper bound 50 cts., Cloth \$1.00.

on one side of the plant as in Fig 4, as it gives a tendency for the tree to be one sided in after growth, as in Fig 3.



Fig. 4 (*C. & C. Gen.*)



Fig. 5 (*C. & C. Gen.*)

In digging up trees for transplanting, caution must be exercised. The results obtained are in direct proportion to the amount of care and pains taken in doing the work.

Fig. 6. represents the method pursued in taking up trees in a reckless manner. Roots are cut off with the spade at about six inches from the tree leaving from five to six feet of roots in the soil. The top of the tree remaining the same as formerly, they are set out again in the desired location, top-heavy.



Fig. 6 (*C. & C. Gen.*)

Prune with reference to allowing the young trees to procure a solid footing, as in Figs 5 and 7, thus preventing the too frequent example of the tops being too heavy for the roots, and as a consequence, many trees are unable to withstand the switching of the wind

and are obliged to be staked up, or will form a cavity around the base of the stem, as in Fig 8, admitting the drying air to the roots,



Fig. 7 (*C. & C. Gen.*)

checking or arresting growth, and frequently killing the tree. Even if the trees are braced up and held in place by mechanical means. In such cases they can not be expected to remain healthy for



Fig. 8 (*C. & C. Gen.*)

the reason that the root surface is far inferior to that of the branches,

and can not supply the tree with enough mineral and sap nutrition. The tree in its natural state is shown well in Fig. 9.



Fig. 9 (*C. & C. Gen.*)

The root system, contrary to the notions of many, spread out and radiate over a considerable space. I might mention, in this connection, the unphilosophical idea prevalent in the minds of many as regards fertilizing trees. The average person wishing to revive his orchard, is found to apply the manure or fertilizer in the immediate vicinity of the trunk. Every one knows that the greatest absorption from the soil takes place through the smaller rootlets, and by examining Fig. 9. we can plainly see that these are in greater numbers some distance from the trunk. Thus to fertilize in order to procure the quickest and most satisfactory returns, the placing of or scattering the fertilizer at some little distance about the tree is advisable.

Prune with reference to the height you desire your branches to start out from the trunk. It is important to remember that a branch which starts from a trunk at a certain height will never get any higher from the ground at its base.

If a person wishes to cultivate his ground for farming purposes, as many do, he thinks it important that the trunk be long in order to raise the branches above the cultivator's head. This may be true, but it is thought more and more that if a person desires to raise fruit and carry on general farming on the same ground he will be likely to fail in both; either devote the ground to one or the other, or one half to one and the remaining half to the other. In this manner of procedure he may thrive in both.

If a trunk separates into two or more equal branches, each branch

grows like a separate tree, but since they generally lean much to one side, they are apt to split apart when loaded with fruit. This may be avoided by keeping the branches subordinate to the main trunk, and the sub-branches subordinate to the main branches.

The tendency of Horticulturists at present is to bring the heads of fruit trees near the ground. The advantages derived from this are :

1. High trees necessitate climbing into them, and they break down. Low ones not so.

2. The low trees can be more easily shaped or pruned.

3. The crop of fruit is easily gathered from low trees.

4. The low headed trees are easily sprayed and thus insects and fungous diseases are more easily combatted.

5. The vigor necessitated by the trunk in a high headed tree is utilized to better advantage by the branches and fruit of the low headed trees.

6. The tendency to draw little plant food from the soil in the way of trunk.

The above is particularly true of drupaceous or stone fruits. The peach, for example, is always sold as yearlings, and when shipped they are cut back to the hard wood. Cut the trees to a stub to make low heads as in Fig 1. Start the head low and train to desired height, which differs with different men. Some train high, others keep the heads low by the shortening in mode of pruning. The latter is practiced by some of our leading peach growers who have the best results. One advantage I notice—in the latter method—is that the trees do not need bracing up when bearing a full crop so much as the former.

While in Michigan last summer, I noticed that the peach trees trained high, in most cases, were in danger of breaking while in fruit, if not propped. On the contrary, those pruned on the low heading-in system which were bearing in West Virginia, stood the strain from the weight of the crop perfectly. It is thought by some of our peach growers in the eastern part of the State that by heading-in each year and by producing a strong frame, the tree bears its crop with less danger to the tree, and a more continuous yearly yield is procured.

Like results, doubtless, could be reached with the high headed trees, if growers would not allow their trees to carry too heavy a crop in bearing season. There is some danger of carrying the heading-in system too far. This should be practiced with caution. See letter, page 24.

Probably the best apple tree to set out is one which is two years from the bud. It may be one to three years old never more than three. The stem of the tree should be straight, and should have been trimmed in the nursery about two and one-half to three feet up to the first branches. They should have made a good growth from the start, and have a clean smooth bark; as in Fig. 10.



Fig. 10.

The root system should be strong and symmetrical, especially on a sandy land having a hard sub-soil. Fig. 3.

The pruning of young orchards is well expressed in the following: "After the well shaped trees of a young orchard have been set out, and summer growth has commenced, the owner should keep his eye frequently on the shape the heads are assuming. He can preserve a good symmetrical form with less than a tenth of the labor by rubbing off needless shoots when only an inch or two in growth than by cutting them off with an ax or saw when as large as his arm. Fig. 11. represents a young or nursery tree which had



Fig. 11.

little attention in giving it the best form, the new head constituting a mass of shoots, which have been allowed to grow at random, and which if still neglected, will grow into a bearing tree with straggling and spreading limbs, as shown in Fig. 12. Trees, the pruning of which has not been properly attended to, have not only a bad and straggling appearance, but a portion of them bending downwards interfere with the passage of the gathering wagon, and will be found to have crowded and crossing limbs, and bearing defective and stunted fruit

"A skillful hand will bring the heads of such young trees by timely pruning, into a much im-

proved shape, but this pruning should never be undertaken after the trees have commenced growing in the spring. A well shaped young tree, previously well formed is represented in Fig. 10. The work to be done at the present time is to maintain this good shape, and even to improve on it by timely rubbing off, early in the season of growth, all deforming and needless shoots. If this is done at the right time, and every year, very little work will be required. Trees thus properly trained and managed, instead of presenting the appearance shown in Fig. 12, will have the form more nearly resembling Fig. 13.



Fig. 12

“In thinning the shoots which constitute the head of a tree the course must vary with the variety and its peculiar growth. For example, in Rhode Island Greening, the general tendency of the remaining branches should be more upward than in forming the head of a Baldwin, and for the Northern Spy still less than in the more spreading varieties.



Fig. 13.

Less care in this respect is required for the younger trees than after many years when they come into full bearing. Heavily loaded limbs which are borne down continuously for several weeks in summer become more or less permanently spreading or drooping and some of them irregular or straggling. The eye of the owner will quickly perceive which shoots can be best spared

and rubbed or cut away. If this care is yearly attended to, it will be but trifling when compared to the heavy work required to cut away larger branches after years of neglect.

“When trees are quite young, the general tendency of the upward shoots may be controled in a great degree by leaving the last bud or shoot on the outside of the tree for an erect grower, and on the inside of the tree for one of spreading growth. For example, in pruning a young Spy, let the upper remaining bud or shoot (next to the cut) be on the outside; and for Rhode Island Greening or Roxbury Russet, let the last bud be on the inner side. But it must be remembered that the bearing trees naturally tend to

become more spreading with age by the weight of the successive crops.

"All these matters are subjects of considerable importance. An evenly pruned tree, allowing an even, uniform growth, and fair bearing vigor, will give a crop of finer, handsomer apples than a tree the head of which more nearly resembles a brush heap, and the bearing shoots of which are crowded, stunted and deformed."*

The best time to order all trees is in the Fall, for then you are apt to get what you want. Later orders will not be filled so accurately and substitutions will be made. This should not be allowed.

If the trees arrive in the Fall, and the ground is in a good condition, they may be set out immediately. Exercise great care in setting at that time; make a mound around them to carry the water off, or else they will heave. Spring is the best time to set trees, and if they are received in the Fall, heal them in. To do this plow a deep furrow and set the trees at an angle of about 30 degrees. Plow the earth over them again and cover with clean straw, or else mice will live there and girdle the trees. Evergreen boughs or leaves are still better.

Pruning of Small Fruits.

Gooseberries, Blackberries, etc.

Pruning of the Currant and Gooseberry are practically the same. About all the pruning that is necessary is to cut out occasionally the old wood and shorten the most vigorous of the young growth. If too many shoots or suckers appear and are likely to crowd, a portion of them should be cut out for the advantage of those remaining. A few large and vigorous shoots give more and finer fruit than double that number of weak and immature ones. The Gooseberry requires an open head, more so than the Currant, in order to allow free access of air which checks the mildew.

The Blackberry and the Raspberry are pruned in much the same manner. The method generally practiced is to cut back the canes to the desired length and shorten the lateral ones. This is practically beneficial to Purple Cane and Black Raspberries, as well as Blackberries. It would be better to take out all the old bearing canes soon after the fruit is gathered, but this would make it necessary to go over the plants twice, while if the old canes can be cut out and the young ones pruned at the same time considerable labor is saved. Therefore, one annual pruning is the usual method, choosing the early spring for performing this operation. In field cultivation the Raspberry is given very little pruning except going over the plantation shortly after fruiting and cut close to the ground all the old canes.

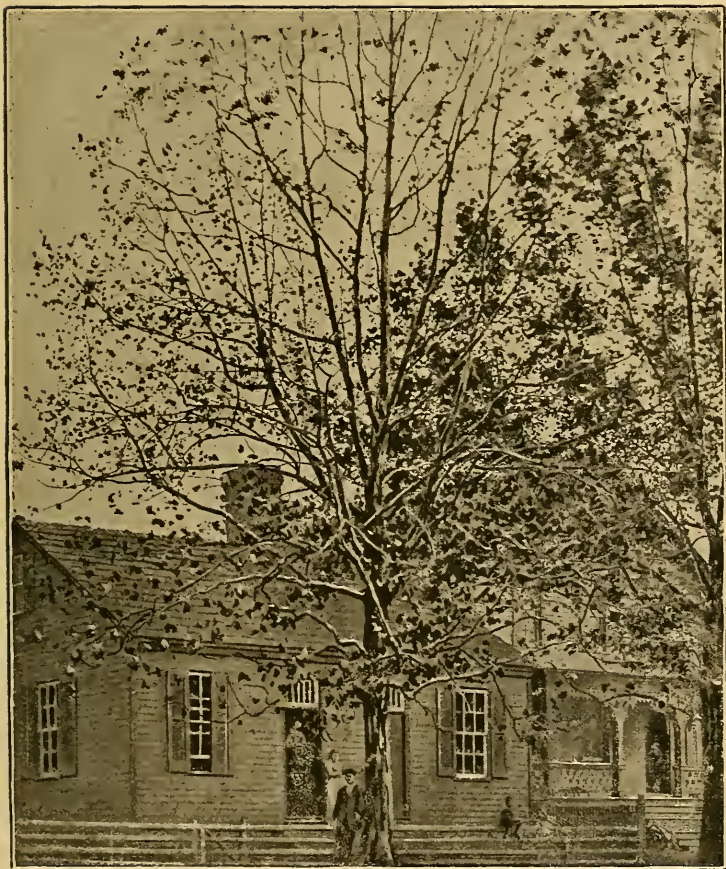
*Cultivator and Country Gentleman, June 16th, 1892. Editorial.

PHOTOGRAPHED BY F. WM. R.



Sycamore Tree for Shade,
Pruned. See pg. 19.

PHOTOGRAPHED BY F. WM. R.



Sycamore Tree for Shade.
Unpruned See pg. 19.

Pruning of Forest Trees.

In the transplanting of forest trees, all should be pruned more or less. As with fruit trees, it is almost, if not quite impossible, to take up a tree without destroying a portion of the root, and it is necessary to reduce the number or length of the branches to fully compensate the loss thus sustained. If the tree is to be grown for timber, then a tall straight stem is required, and where there is more than one leading shoot, they should be cut away. Remove the lower branches from time to time, always leaving enough to form a good head to the tree. In cutting off a branch, never cut it off parallel with the tree, but at right angles with the branch severed, as in Fig. 14. All branches indicate the place to sever the same, which is just at the outer edge of the enlargement, found at the base. Endeavor to procure as smooth a cut surface as possible, and if thought necessary, a coating of melted grafting wax, or any good mineral paint, answers every purpose.

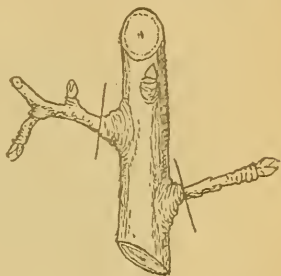


Fig. 14. (*Original.*)

Pruning Ornamental Trees and Shrubs.

This varies as to the idea of the pruner. Many ornamentals can be pruned to take almost any desired form. Especially is this practiced and elaborated by gardeners of the Old World. Trees, through pruning, can be made to produce a dense shade. Plates A and B are perfect examples of this. A was pruned last Spring, while B was not. Both are Sycamore trees growing here in Morgantown of about the same age and size. Both photographs were taken by myself at the same time, and numerous leaves had dropped from both trees. A, besides being more dense, has leaves four or five times their original size.

Pruning Grape Vines.

The reasons for pruning the grape are:—

1. To keep the vine within limits.
2. To have smaller tops than roots.
3. To thin the fruit; even a greater weight of fruit is procured upon trimmed vines

The fruit of the grape is borne upon shoots or wood of the current year which come from wood of the preceding year.

The following should be understood:—

- (a) A shoot is a growing branch.
- (b) A cane is a matured shoot.
- (c) An arm is a cane more than a year old. []

The Horizontal Arm Spur System of Pruning.

When the vine is set out, which is generally done in early Spring, it contains about two buds. The stronger is allowed to grow at will all Summer with cultivation, the weaker bud being rubbed off. In the Fall, cut back to two buds again.

Second Season. If the vine is weak repeat the above. If strong allow two shoots to grow and these form the permanent arms of the vine. Plate C. is from a photograph taken by myself of the W. Va. Station vineyard at the end of the second year.

Third Season. Cut each arm back to three to four feet, depending on the distance between the plants. Have three wires on a trellis, never more than four are used. Tie the arms to the bottom wire, and allow the shoots to start on each arm about one foot apart. These should be pinched back occasionally during the summer to cause the formation of side branches, which makes the cane stocky. Whenever the shoots reach the top wire, they should be checked from growing further.

Fourth Season. Cut back the shoots to two buds, the stumps being called spurs, and they may have from one to three or four buds. Pinch the shoots as before. This year's growth produces first crop, each shoot bearing from one to three bunches of fruit. From now on cut back the shoot or fruit producing branch to one inch, and new ones will spring forth for following crops.

Arms usually last from four to eight years, and new shoots from the roots are gradually brought up to take their places.

The Renewal System.

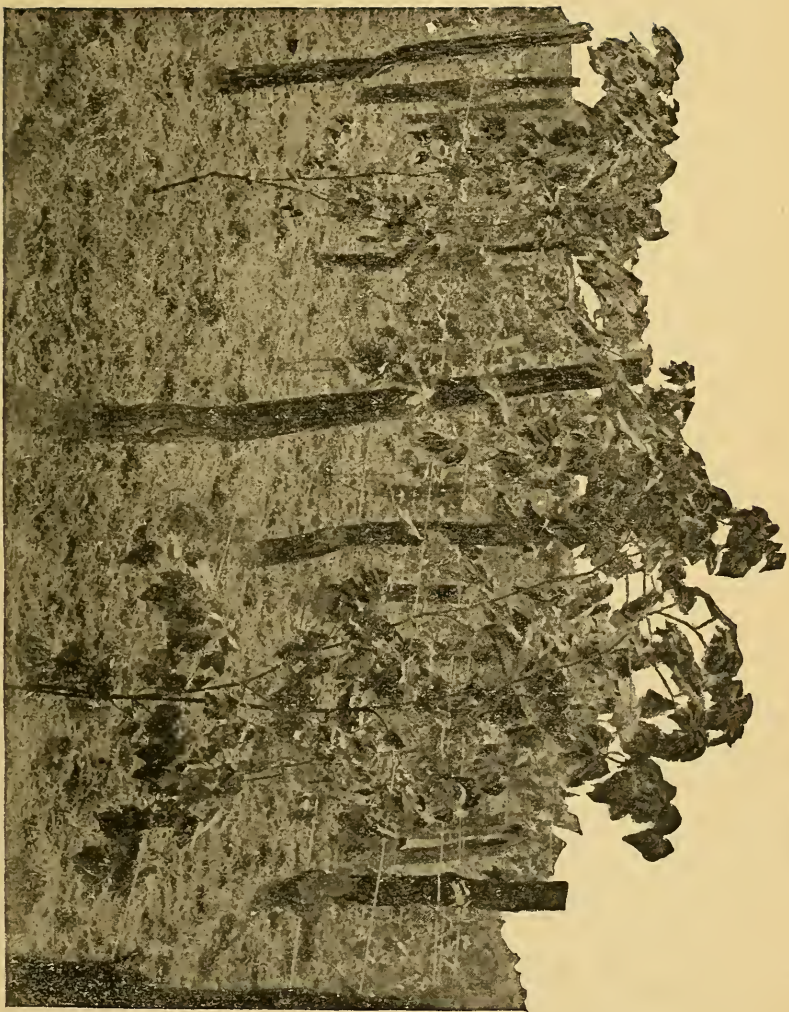
By the renewal system of pruning, each arm is allowed to bear but one crop and others are brought up from the roots, leaving three stages present all the time.

The Long or High Renewal System.

This system of pruning is the one most practiced. At the end of the second year trim one cane back to two buds, and the other to four buds; the former to grow upright as the previous year, and the latter to be placed at an angle of 45 degrees, and allowed to produce fruit, the fruit spurs being pinched off after three or four leaves have formed beyond the set fruit. The next year, the branch producing fruit this year is cut back to two buds, to be grown up-right the next year, while the two parallel shoots are brought to a slant of 45 degrees each way and made the fruit bearing canes of the following year.

The Kniffin System.

This system is much used in the Hudson River Valley. It is supposed to make the vines grow less and bear more. The arms are



W. Va. Agr. Expt. Station Vineyard. End of Second Year.

on the top wire, and the shoots hang down as in Fig. 15. They save much tying, hanging down by their own weight and no other care is required except it be to rub off needless shoots, as they start in growth. The chief advantage is in saving of labor; prevention of rampant growth in bearing shoots; fewer wires are used as they are required to support horizontal arms only, but one wire is needed for each arm; and but two wires are required for the trellis.



Fig. 15, (C. & C. Gen.)

The best success is procured with the arms kept moderately short. This mode of training is particularly recommended for those who can not spare the time for the more elaborate modes. Fig 16 represents the same system with leaves off.

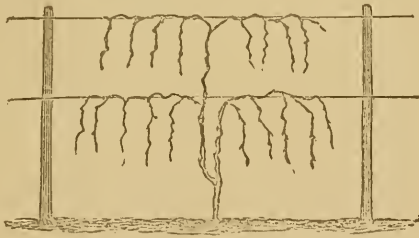


Fig. 16 (C. & C. Gen.)

The Modified Horizontal Arm System.

This system is the one practiced mostly in the Chautauqua grape belt. One stem is allowed to grow nearly to the lower wire, and from this, on either side, an arm is carried along the wire. These arms are not tied to the wire, but twisted around it two or three times, and thus securely held in place. Each arm is allowed to bear from two to four canes only; the rest are cut away. The plants are set about eight feet apart in the rows, but some growers have the arms only two or three feet long. These arms are not renewed for years.*

The Fan System.

This system is in reality a modification of the Horizontal Arm Spur System. It differs in that the arms are tied and trained on the trellis to represent a fan in shape.

The Thomery System.

This system originated in France. It is neat, symmetric and ef-

*"Grapes in Chautauqua," American Garden, Nov. 1892, by E. G. Loedman.

fective when thoroughly practiced, but it requires considerable skill and much labor. See Fig. 17.



Fig. 17. (*C. & C. Gen.*)

The Guyot System.

This is a modification of both the Renewal and the Spur systems, but in my estimation not as good as either of the former.

Munson's Alternate Renewal System,

This system is named after T. V. Munson, of Texas, the originator. It consists of two parallel wires each four feet from the ground and two feet apart, which are supported upon the end of slanting posts, which are set in the ground at a point perpendicular to one-half the distance between the wires. Four vines are set eight feet apart between the posts, sending up a branch to each wire, and these in turn extending arms either way upon the wires, which alternate each other in bearing, the fruit hanging down, as in the Kniffin System. This system, to my knowledge, is only practiced in the South.

The Post System

This system of training is declining in favor, the main reason being that it aids mildew of the vines. As the name implies it consists in training to a post, and accompanied with the necessary pruning.

Among my correspondence, I find a letter that I deem of great value, and therefore publish it in full. It is from Mr. Chas. Becker, the Horticulturist, spoken of before ;

MILLVILLE, JEFFERSON CO., W. Va. }
Nov. 8, 1892. }

PROF. F. WM. RANE,
Morgantown, W. Va.

MY DEAR SIR :—Your favor came to hand. I was very glad to hear from you. In regard to our method of pruning the peach, they bear not so many fruits, but larger and better fruits, and as many bushels by shortening them in every season, more or less, according to the growth they make. This season we will not prune them quite so short as we did last season. On account of the drought they did not make as large a growth. We prune the Apricots and Plums

the same as the Peach. We had adopted the "Fuller System" for two years in training our grapes, but found that system no good, as we lose the growth at the crown by that system, so we have adopted the "Fan System" the past season, which we think is the best ; although another season will demonstrate it much better, when it will show how the short spurs will act. Grapes can not always be trained just alike, as some are much stronger growers than others; consequently it takes longer to get them in good fan shape.

We commence pruning the latter part of this month, and continue until Spring, taking mild, pleasant days for it. We tie up the vines after we are done pruning.

Yours truly,

CHAS. BECKER,
Horticulturist.

